

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-17 (cancelled).

18 (previously presented). A process for the preparation of a two layer metal palladium – or palladium alloy – composite membrane consisting of a porous substrate support and a palladium – or palladium alloy – membrane comprising the following consecutive steps:

- 1) rinsing/washing and drying the porous substrate support,
- 2) treating the porous substrate support with a pore filler in order to decorate the pores of the support and the disfigurements of the substrate surface,
- 3) sensitizing and activating with a palladium solution the decorated substrate support,
- 4) plating the resulting support with a palladium solution to form the two layer composite membrane,
- 5) drying, and
- 6) subjecting the resulting composite membrane to a post-processing where the pore fillers residing in the pore-channels of the porous substrate are partly removed or reduced in volume through heating.

19 (previously presented). A process according to claim 18 wherein step 2 is performed under vacuum by immersing the porous substrate in a solution of pore filler in order to ensure that the pores and the disfigurements of the substrates are preoccupied with the filler and that there is no palladium ingress into the pores during the consecutive preparation steps.

20 (previously presented). A process according to claim 18 wherein in step 3 the porous substrate support is sensitised in SnCl_2 solution and activated in PdCl_2 solution, respectively.

21 (currently amended). A process according to claim 18 wherein in step 4 the porous substrate is immersed in a an electroless plating solution.

22 (previously presented). A process according to claim 21 wherein the electroless plating solution has the composition of $[\text{Pd}(\text{NH}_3)_2]\text{Cl}_2$, EDTA 2Na, $\text{NH}_2\text{-NH}_2\text{-H}_2\text{O}$, $\text{NH}_3 \text{ H}_2\text{O}$.

23 (canceled).

24 (previously presented). A process according to claim 18 wherein the composite membrane is dried and then calcined at at least 300°C .

25 (previously presented). A process according to claim 18 wherein the pore fillers used have a particle size lower than 0.2 micron.

26 (previously presented). A process according to claim 18 wherein the surface pore fillers are selected from the group consisting of gels, sols, colloids and precipitates.

27 (previously presented). A process according to claim 26 wherein the pore fillers are selected from the group consisting of Al-sol, Si-sol, Ti-sol, Zr-sol and Ce-sol.

28 (currently amended). A process according to claim 26 wherein the pore fillers are selected from the group consisting of hydroxide-colloid, ~~alkali-carbonate colloid~~ and carbonate colloid.

29 (currently amended). A process according to claim 26 wherein the pore fillers are selected from the group consisting of hydroxide-precipitates, ~~alkali-carbonate precipitates~~ and carbonate precipitates.

30 (canceled).

31 (previously presented). A process according to claim 18 wherein the porous substrate support is selected from the group consisting of porous stainless steel, porous nickel, porous glass and porous ceramics.

32 (previously presented). Process according to claim 18 comprising, after step 2 and before step 3, the step of cleaning the substrate support in order to remove the excess of surface pore filler when an excess of pore filler resides on the substrate support surface.

33 (currently amended). A process according to claim 18 wherein the post-processing includes heating in step 6 is done by either pyrolysis or calcination of the pore fillers.

34 (previously presented). A process according to claim 25 wherein the pore fillers used have a particle size lower than 0.1 micron.

35 (previously presented). A process according to claim 25 wherein the pore fillers used have a particle size lower than 0.05 micron.

36 (new). A process according to claim 28 wherein the carbonate colloid is an alkali carbonate colloid.

37 (new). A process according to claim 29 wherein the carbonate precipitates are alkali carbonate precipitates.